

cable, say about an inch in diameter, composed of copper wires, each about one-sixteenth of an inch in diameter. The cable will be laid in a trench immediately under the flagging of the side walk, and near the curb; every twenty-five feet a wire will be dropped to carry the current into a house, and when the terminus of the cable is reached there will be one wire left. Of course it will be necessary to construct the cable according to the number of houses in each district. As a district increases in population the flagging can be taken up, and a section of cable can be placed alongside the original cable, and joined to it at each end. Thus the new houses can be supplied.' 'Will there not be a loss of electricity by induction or the influence of the earth?' 'None whatever. And now I will tell you another thing. It is perfectly easy for me to get a light equal to sixty-six candles from each of my lamps; but I limit them to six.' 'Will not the construction of your station and your cables be very costly?' 'No; and if it were, the profits would warrant the outlay.'"

Copper wires one-sixteenth of an inch in diameter—the same size as those often used for telegraphic purposes—are to convey currents of electricity to light up lamps whose resistances are as 192 to 1 as compared with carbon, or as 100 to 1 as compared with the conductor. The resistance of the copper wire is about 13 ohms per mile. What current will be required to produce a light of 66 candles a mile off under such conditions? An electromotive force of a 1,000 volts would not do it, and the very best machines do not much exceed 100 volts in this respect. Where is the power to come from? Mr. Edison now proposes to have 30 of his new dynamo machines worked by his 80-horse-power steam-engine, lighting up 400 lights. In other words, each machine is to produce about 13 lights, and to absorb $2\frac{2}{3}$ horse-power. This shows that his experience is gradually bringing him down to the limits of our experience in France and England, where for some time past one machine lights up twenty lights, but with an expenditure of 23-horse power. It also shows that he was premature in announcing the solution of the indefinite subdivision of the light, and that he would have done well to have worked upon the experience of others rather than have learnt that experience himself by an immense expenditure of time and money. The electric light, theoretically and practically, is unquestionably more advanced in Europe than it is in America. But even here the progress in lamps is very slight.

Col. Bolton, in a remarkable paper read at the last meeting of the Society of Telegraph Engineers, has shown that electric light manias are not only periodic, but that the very same inventions are to a certain extent, also periodic. Thus he showed that everything that Mr. Edison has patented has been patented before in England.

NOTE AS TO DISTINGUISHING CHARACTERISTICS FOR ILLUMINATED BUOYS

THE plan of illuminating by means of Pintsch's system of forcing gas into floating buoys having now been tried by the Trinity House and by the Harbour Authorities of the Tay, I have lately been engaged in considering the best means of distinguishing one buoy from another.

The plan which occurred to me was to make the flow of the gas produce automatic intermittent action, and for this purpose some form of gas meter seemed to promise best. I applied to Messrs. Milne, gas engineers, Edinburgh, to give me their assistance in the matter, and they have succeeded in making a modification of a dry meter which has been tried and found to work very satisfactorily. By this arrangement a small supply of gas keeps a small jet constantly illuminated a little above the principal burner,

and when, by the valve, the full supply of gas is turned on to the large burner, it is ignited by the small jet. The periods of light and darkness can be regulated in any desired proportion. The same object may, however, be effected by means of a single burner, the jet being kept burning in the socket.

By means, then, of two separate lanterns, one of which has red panes, and the other either white or green, the following characteristics may be produced:—

Red and white.
Red and green.
Green and white.

If, again, only one lantern be used, we shall have—

Intermittent white.
" red.
" green.

And if to these we add the present single fixed white, red, and green, this would give in all nine characteristics, which would probably be sufficient for any navigation.

It is proper to add that, in order to prevent oscillations of the apparatus, which would take the light out of the sailor's vision, the apparatus and burner should be made to work in gimbals, as in my steamer's lights. If these gimbals were made hollow, the gas could be easily made to pass up to the burner, but a simpler mode would be to use a flexible tube between the regulator and the burner.

THOMAS STEVENSON

GEOGRAPHICAL NOTES

LETTERS from Nordenskjöld have been received by the Governor-General of Siberia. They confirm the news already brought to Europe. The *Vega* steamship has been blocked by ice in a harbour named Kamen, at a short distance from Behring Straits on the east coast of Siberia. This station is easily reached by whalers every year. No doubt the escape of the explorer and his companions will take place without difficulty as soon as the ice breaks up, probably in a few weeks. The news has been brought by native messengers, and everything was going on well on board the *Vega*.

M. WOEIKOF has sent to the French Geographical Society a long and exhaustive memoir on the Oxus question. After having studied the question on the spot, the Russian geographer feels certain that the suppression of the Caspian mouth was produced not by a gradual elevation of the country, but by the accumulation of deposits in the bed of the river, and the immense drainage produced by the development of irrigation in the Khivan Oasis. He feels certain that the restoration of the former state of things would be a very easy work. It would result in the establishment of a new oasis between Khiva and the Caspian Sea. The Oxus being navigable to Balkh, and the Volga being in direct communication with the Baltic, through a system of canals, a water-way would thus be established from St. Petersburg to Balkh, and the stream would connect the Russian capital with the vicinity of their scientific frontier of India. M. Woeikof supposes justly that the restoration of the Oxus to the Caspian would accelerate the retreat of the Aral waters. He believes that shortly after that large operation the area of Aral would be reduced to one-third of its present extent. But he argues that this alteration would not be altogether detrimental to the prosperity of the surrounding countries.

THOUGH there are no journeys of discovery into the interior to record, some useful geographical and topographical work was done in Western Australia by the Surveyor-General's department during the last six months of 1878, as we learn by a report just received from Perth. The position of Mount Welcome at Roebourne, on the north-west coast of the colony, was determined to be

about S. lat. $20^{\circ} 46' 6''$, E. long. $117^{\circ} 7' 55''$. The courses of the following rivers were correctly traversed and mapped:—De Grey River, 100 miles; Turner, 25 miles; Yule, 50 miles; Sherlock, 50 miles; Fortescue and tributaries, 300 miles; Robe, 50 miles; Cane, 70 miles; Ashburton and tributaries, 150 miles; making a total of 795 miles. The heights of mountains have not yet been calculated, but a triangulation was made of the country between the De Grey and Ashburton Rivers, covering an area of 30,000 square miles. Maps of the districts above-mentioned are in preparation, but are not yet completed. The report of the work performed during the current half year will, no doubt, contain some interesting information, as a party, under the command of Mr. Alex. Forrest, started in January last to undertake the exploration of the previously unexamined tract of country in the north-west lying between the De Grey and Victoria Rivers.

BARON VON MÜLLER, in a letter to Petermann's *Mittheilungen*, states that Mr. Tietkens, who accompanied Giles on his two last journeys, has left Adelaide for Bel-tana at the head of a camel expedition fitted out by Mr. Elder for exploration along the region lying inwards from the great Australian Bight. Mr. Tietkens informed us when he was in this country that he was confident that long stretches of fine pasture-land would be found at various parts of this region, and one of his objects is apparently to find these. Baron von Müller speaks highly of Mr. Tietkens's qualifications as an explorer and surveyor, and expects that in the course of the next few years he will do much to add to our knowledge of the geography of the Australian interior.

M. SOLEILLET, the French explorer of North Africa, has arrived at Marseilles from St. Louis, in Senegal. He has been received by the Geographical Society of that city, and will deliver a lecture on the necessity of opening the way between Senegal and Algeria, *via* Timbucktoo. It is said that he will, at the suggestion of *Akhbor*, be called to Algiers by the Governor-General before going to Lyons and Paris, where he will deliver lectures on the same subject. In this connection we may state that an interesting ceremony will take place in a few days. The inhabitants of a small country place in the Eure department will remove to another site the grave of René Caillet, the celebrated Timbucktoo explorer, who died in 1838, and was the first laureate of the French Geographical Society. The Society will bear the expenses of exhumation, and send delegates to witness it. One of them will be M. Soleillet.

IN No. 20 of *Globus* of this year is a short article of some interest showing the physical and moral changes in the population of Siberia by the mixture of Russian colonists with the native races.

WE take the following from the *Gardeners' Chronicle*:—Mr. Goldie, the naturalist, who has passed the last eighteen months in New Guinea in search of plants for Mr. B. S. Williams, of Holloway, has, the *Brisbane Courier* states, collected an immense number of animals, birds, and insects, besides valuable botanical specimens, and believes that a large number of these are entirely unknown. He claims to have found an entirely new species of kangaroo. He has brought with him a native from the coast tribes, a good-looking lad of indistinct Malay origin, whose long curly hair, tied round with a string, is worn standing straight up. The natives of the inland tribes Mr. Goldie states to be entirely different from those on the coast in both appearance and customs, but all, he says, are friendly and good-natured, and not given to the deeds of ferocity lately detailed by us on the authority of the residents at a *bêche-de-mer* station. Mr. Goldie was of the party that made its way to the coast, crossing about twenty flooded rivers, and losing horses and baggage, and states that although they crossed some high ranges they never

reached the dividing range, on the other side of which, the general belief amongst the party was, that payable gold would be found. The natives in the interior are, it appears, so awed at the sight of a white man as to obviate any risk of molestation. The custom of a tribe with whom Mr. Goldie's party came in contact, suggested to them the probable origin of the rumours that have been always current of a race of tailed men in some remote corner of the globe. These natives wear artificial tails of such cunning construction as to entirely mislead a casual observer. They are entirely naked, except for the caudal ornament, which is a plait of grass fastened round their loins by a fine string, and depending behind to about half-way down their legs. Possibly the missing link that has so baffled Darwin has only lately become extinct in New Guinea, and these descendants, ashamed of their degeneracy, keep up the tradition of a noble ancestry by simulating their distinguishing characteristic.

THE Austrian *Monatschrift für den Orient* of May contains an article of much practical and some ethnological value on the Nations of the Turkish Empire as factors in the National Economy; he reviews the condition of the various industries, and the character of the various ethnical elements of the Turkish dominions. Herr A. von Wassberg contributes a paper on the Migrations of the Inhabitants of the Ionian Islands, while Herr Schick continues his elaborate papers on Agriculture in Palestine.

THE May number of Petermann's *Mittheilungen* gives the chief place to a long and careful article by M. Lindeman on the North Coast of Siberia between the Mouths of the Lena and Behring Straits. Herr Lindeman traces the history of exploration in the region from 1630 to the present time, and follows this with a description of the coasts and islands. The article is accompanied by an excellent map in two sheets. Dr. Emin Bey, Governor of the Egyptian Equatorial Provinces, contributes an interesting Journal of a Journey from Mruli to the chief town of Unyoro, abounding with valuable notices on the country and people.

THE March number of the *Bulletin* of the Paris Geographical Society contains, as its first article, the first part of a learned paper by M. de Saulcy on the cities of Upper Louten, the Syria of the Ancient Egyptians. Other papers are on the frontiers of Russia in Central Asia, by M. de Ujfalvy; explorations of the Cunene, by M. Nogueira; and the dried-up rivers of the Dobruja, by Herr F. Kanitz.

NOTES

THE University of Cambridge proposes to confer the honorary degree of LL.D. upon the following, among others:—Mr. Justice Grove, Mr. W. Spottiswoode, President of the Royal Society, Mr. Henry J. S. Smith, Savilian Professor of Geometry, Oxford, Prof. Huxley, Mr. H. C. Sorby, F.R.S. The Rede lecture will be delivered in the Cambridge Senate-house at 2.30 on Wednesday, June 11. The lecturer, the Rev. W. H. Dallinger, has chosen the following subject:—"The Origin of Life as illustrated by the Life Histories of the Least and Lowest Organisms in Nature."

THE Forty-Ninth Annual Meeting of the British Association will commence at Sheffield on Wednesday, August 20, 1879. The President Elect is Prof. G. J. Allman, LL.D., F.R.S., Prof. L.S. Vice-presidents Elect—His Grace the Duke of Devonshire, K.G., F.R.S., the Right Hon. the Earl Fitzwilliam, K.G., the Right Hon. the Earl of Wharfedale, W. H. Brittain (Master Cutler), Prof. T. H. Huxley, Sec. R.S., Prof. W. Odling, F.R.S. General Secretaries—Capt. Douglas Galton, C.B., F.R.S., Philip Lutley Sclater, Ph.D., F.R.S. Assistant